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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE • APRIL 28, 1945

Rockets for Palawan

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ASTRONOMY

"Young" Galaxies

Watch-shaped groups of stars, with long spiral arms may eventually develop into compact globular clusters of suns, Dr. Harlow Shapley states.

➤ WATCH-SHAPED groups of myriads of stars, with long spiral arms like those of a fiery pin-wheel, may be "young" galaxies that will eventually develop into compact globular clusters of suns, Dr. Harlow Shapley, director of the Harvard College Observatory, stated upon receiving the Franklin medal, the highest award of the Franklin Institute.

"The suggested direction of evolution is the reverse of that proposed by Sir James Jeans many years ago, who assumed that the spheroidal galaxies, through rotation, become flattened and develop spiral arms," Dr. Shapley said in presenting his alternative tentative hypothesis as to how galaxies evolve.

Spiral galaxies, like our own Milky Way system, contain many clouds of stars and star-dust, Dr. Shapley explained. Differential rotation within such galaxies would gradually tend to eliminate these clusters and clouds. Thus, as they develop, the spiral galaxies should become free of such non-uniformities and take on the smooth structure characteristic of the spheroidal galaxy.

Like our own Milky Way, the wheel-shaped galaxy contains many supergiant stars. Stars which cluster together in elliptical and spherical systems, on the other hand, are almost never supergiants. Since it is at present believed that the life of a supergiant star is relatively short, the existence of supergiants would indicate that the spirals are less developed, Dr. Shapley said, unless such supergiant stars are still being born.

"New studies made with the South African reflector of the Harvard Observatory," the Director stated, "suggest that there are truly transitional types between the open and the compact star clusters—a phenomenon that had not been evident from the studies of the globular clusters of our own galaxy."

Our own Milky Way is about 100,000 light years in thickness, Dr. Shapley pointed out. Remeasurement of the distances of about 30 of the 100 globular clusters of our galaxy established the thickness of the haze of stars and clusters that surrounds the flattened watch-shaped main body of the galactic system.

Giant globular clusters are about as bright and of the same general structure as the nuclei of some of the spiral galaxies. From comparisons of the greatest of globular clusters and the smallest of the spheroidal galaxies, we believe that clusters like the southern hemisphere groups of stars, Omega Centauri and 47 Tucanae, Dr. Shapley said, are organically related to such galaxies as the companions of the great Andromeda Nebula, our nearest neighbor.

The study of globular star clusters has made four major contributions to the study of the sidereal universe, Dr. Shapley pointed out:

"The first developed rapidly at the Harvard Observatory about fifty years ago when Professor S. I. Bailey began his extensive work in the discovery and study of variable stars in the brighter globular clusters. Eventually a dozen workers entered the field. The 'cluster-type Cepheids' were linked up with the regular or classical Cepheids into the period-luminosity relation, which has provided us the yardstick for measuring our galaxy and others.

"The second somewhat revolutionary discovery concerns the candle-powers and colors of stars in globular star clusters. The distribution of the cluster stars among the various candle-powers and spectral classes (colors) was found to be distinctly different from that of stars that surround the sun. Later this globular cluster distribution was found to be characteristic of the nucleus of our galaxy and the nuclei of other spiral galaxies like the Andromeda Nebula; and similar also to the distribution in the great spheroidal galaxies.

"Through their non-symmetrical distribution in the sky, globular clusters gave us our first clear indication that the center of our galaxy is very distant in the direction of Sagittarius.

"The high radial velocities, frequently more than a hundred miles a second, have shown that the clusters, perhaps like high-latitude Cepheid variables, have a peculiar part in the structure of the

FRANKLIN INSTITUTE MEDAL DAY DINNER—Back row, left to right: Dr. Rupen Eksergian, Levy Medal; Dean Gilmore D. Clarke, Brown Medal; Sanford L. Cluett, Longstreth Medal; Dr. Henry B. Allen, Secretary and Director, Franklin Institute; Greer Ellis, Certificate of Merit; Walter J. Coppock, Certificate of Merit; Dr. Zay Jeffries, Clamer Medal. Front row: Prof. Lewis F. Moody, Cresson Medal; Dr. Harlow Shapley, Franklin Medal; Charles S. Redding, President, Franklin Institute; Rear Adm. Stanford Hooper, Cresson Medal; Edwin A. Link, Potts Medal.

galaxy, unlike that of neighboring stars or the stars of the Milky Way."

Other medals awarded were the Cresson Medal, the Potts Medal, the Levy medal, the Clamer Medal, the Brown Medal and the Longstreth Medal. (*See SNL*, March 31.)

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PSYCHOLOGY-SAFETY

Disabled Have Accidents

Excessive number of accidents occur among workers with certain types of impairments, especially hearing defects. Efficiency equal to able-bodied.

➤ WORKERS with physical disabilities have more accidents than able-bodied workers, although the two groups are about equal in production and efficiency, Dr. Verne K. Harvey and Dr. E. Parker Luongo, medical director and assistant medical director of the U. S. Civil Service Commission, report, (*Journal, American Medical Association*, April 14).

Their findings are based on a study made in preparation for the responsibilities the Commission will have in placement of disabled veterans.

The job performance of 2,858 physically impaired workers and of 5,523 able-bodied workers, both male and female, of similar age, experience and occupational characteristics was compared. The workers were employed in 43 establishments of the War and Navy Departments in various parts of the country.

An excessive number of accidents occurred among workers with certain types of physical disabilities. Workers with hearing defects had accidents at the most frequent rate and at the highest severity rate of all impaired workers.

The other types of impairment which accounted for an excessive number of accidents were deformities of shoulder and hip, amputation of fingers and visual defects.

A psychologic factor plays an important part in accident proneness. This is true of both able-bodied and physically impaired workers. It is more significant, however, among workers with certain types of physical defects.

Fatigue may be important in this connection. The study showed that physically impaired workers given to frequent accidents also had frequent short absences for illness. Those who most often report minor illness may get tired more easily and be more likely to have accidents. Workers with arrested tuberculosis had the highest average number of days lost because of sickness but the lowest rate for frequency of accidents. This may be because a large number of them take sick leave as a precautionary measure, having been taught while under treatment for tuberculosis to avoid fatigue.

Among significant findings of the study was the fact that less than one-tenth of the impaired workers were given special considerations with regard to transportation, lunch and rest periods, hours of work, methods of remuneration, special equipment or reporting time.

"The commission will continue," the report concludes, "to stress the need for, and within the limits of its authority, aid in the development of adequate health and safety programs for federal employees, so that disabled veterans and other impaired workers will be judiciously placed in positions where they may function proficiently and safely."

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SEISMOLOGY

Two Earthquakes Recorded Weekend of April 14-15

➤ TWO EARTHQUAKES shook the earth's crust at widely separated spots under the ocean bottom, during the weekend of April 14-15, seismologists of the U. S. Coast and Geodetic Survey determined, from data transmitted telegraphically through Science Service.

The first epicenter was off the coast of Kamchatka, in the region of latitude 55 degrees north, longitude 161 degrees east. It was a strong shock, originating at 10:35.1 p.m., EWT, on Saturday.

The second quake, which was of only moderate intensity, had its epicenter off the west coast of Mexico, below the mouth of the Gulf of California, in approximately latitude 23 degrees north, longitude 108 degrees west. Time of origin was 3:50.5 p.m., EWT, on Sunday.

Observatories reporting were those of the Jesuit Seismological Association at St. Louis University, Georgetown University, Weston College in Massachusetts and Spring Hill College near Mobile, Ala., and of the U. S. Coast and Geodetic Survey at Ukiah, Calif., and Tucson, Ariz.

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Grass will grow on rocky road shoulders if from 5% to 10% of clay soil and some fertilizer are added.

The deepest *oil well* drilled up to the present time is a 16,246 foot hole at Taft, Calif., in which some oil was found at the 11,000 foot depth but none below; it took 17 months to drill the well.

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PSYCHOLOGY

Monkeys Use Concept

That animals can be taught to sort objects in a complex way may make possible new research of effects of brain injuries such as suffered by soldiers.

➤ A MONKEY trained to sort out objects by color in a complex way may open the way for new research on the functioning of various parts of the brain and on the effects of brain injuries such as those suffered by soldiers in the war.

This is the monkey's problem: To look at an assortment of red and blue objects—little flower pots, glass ash trays, skeins of wool, feathers, cups, thimbles and blocks—and to sort out all the blue objects when he is given a cue in the form of an uncolored ellipse-shaped block, or all the red objects when he is shown an uncolored triangular block.

You can do this, because you have a human brain, not a monkey's. Or, at least, you can do it provided you have not had certain kinds of brain injuries. It has not been supposed before that monkeys could be taught to do it.

This experiment in training a Rhesus monkey to use such an abstract concept as color and to respond to a symbol in much the same way as is done in some human intelligence tests, was conducted by Dr. Benjamin Weinstein in the University of Wisconsin's Primate Laboratory. Dr. Weinstein hopes that the accomplishment may make it possible to use monkeys in research that will throw new light on the effect of brain injuries that sometimes damage this ability in symbolic thinking.

Preliminary experiments make him think that it may some day be possible to teach the monkey, Corry, to respond to the spoken words "red" or "blue" instead of the triangle or ellipse.

Corry's achievement did not come overnight. It is the result of a long course of instruction in which he was first taught to match two objects similar in both color and form. Later he learned to pick all the objects of the same color as the one he was matching, regardless of variations in size and shape. He learned to pick all objects of one color even when they differed in brightness and saturation. Finally, in the last step of the instruction, he learned to pick out all the blue or all the red objects when the object that served as a signal to him was not itself colored.

Details are reported in *Genetic Psychology Monographs.*

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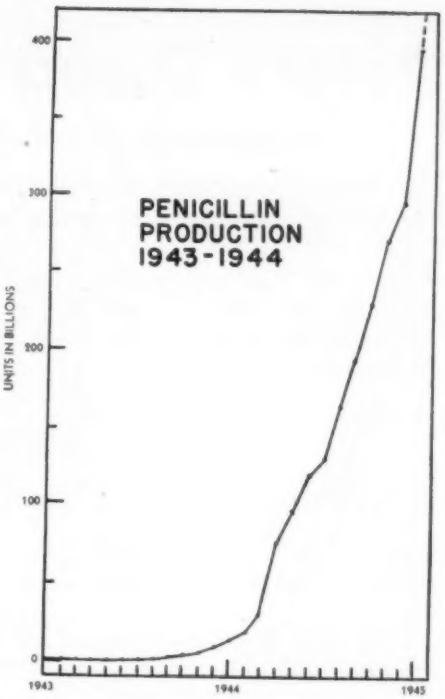

PENICILLIN CURVE—Why your doctor can prescribe penicillin today whereas he could not, in most cases, a year ago is shown in this spectacular penicillin production curve prepared from War Production Board figures by the editor of the Practical Pharmacy Edition of the Journal of the American Pharmaceutical Association. The 1945 production will be triple or quadruple that of 1944, Fred J. Stock, chief of the drugs and cosmetics branch of WPB's chemical bureau, predicts in a report to the pharmaceutical journal.

GEOLOGY

Oil from Borneo

➤ OIL from the wells of Borneo may soon fuel American planes and warships in the Chinese seas and the Philippine area, if MacArthur continues his progress from the Sulu islands into Borneo, to which this archipelago leads. Since the occupation of Borneo, Java and Sumatra by the Japs, these three islands have furnished Japan with most of its fighting fuel, the Borneo production being the most important. The tanker line to Japan has already been cut; now it is necessary to capture the wells.

Borneo is the second largest island in the world, not counting Australia and Greenland. New Guinea is about 10% larger. Borneo is nearly as large as Texas and Louisiana together, with an area of approximately 300,000 square miles. North Borneo and Sarawak together constitute British North Borneo, two independent states. They contain about 82,000 square miles of territory and had a prewar population of approximately 800,000 persons, of whom less than a thousand were Europeans.

The rest of Borneo is a part of the Netherlands East Indies; its prewar population was over 2,000,000. North Borneo occupies the northern tip of the island and is the area adjacent to the Sulu archipelago. Sarawak occupies the entire northwest coast bordering on the South China sea.

Both parts of Borneo produce oil. British North Borneo produced nearly 777,000 tons of petroleum in 1939, and the Netherlands Borneo over 8,000,000 tons in 1938—figures for 1939 not being available.

Many other products of Borneo were essential items to Japan, although not as essential to the Allies at the present time as the oil. The British area produced coal, copper, manganese, gold, iron and tin. Its principal non-metallic product was rubber. The Netherlands Borneo produced asphalt for paving, bauxite for aluminum, industrial and gem diamonds, manganese, phosphate rock for fertilizer and other uses, sulfur, silver and tin. For foods it raised much rice, and also sugar, coffee, tea and coconut products.

The island of Borneo is generally mountainous, without any very high elevations and few distinctive mountain ranges. Its climate is hot and damp, and it has a rainfall of about 150 inches a year. Improved highways are not plentiful. It has some fairly good ports.

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Shoulder blades of *bison* were used for hoes by some American Indians.

MEDICINE

Artery Disease Research

President Roosevelt's death may focus attention on the need for study of this major cause of death as in life he called attention to polio needs.

➤ IN LIFE President Roosevelt more than any other person focussed the nation's attention on the need for funds to fight infantile paralysis.

Perhaps his death will focus attention on the big medical problem of heart and blood vessel disease. Cerebral hemorrhage, from which he died, is part of this big problem. The strain that causes hemorrhage from blood vessels in the brain in one man may fatally damage the blood vessels of the heart in another.

Diseases of the heart, arteries and kidneys cause the majority of the adult deaths in the United States, Dr. Henry S. Simms, of Columbia University College of Physicians and Surgeons, told the Senate Subcommittee on Wartime Health and Education at a hearing last December.

The number of these deaths is increasing yearly and is far in excess of war casualties, he stated.

Although heart and artery diseases killed 536,745 persons in the United States in 1940, only $93,835 was spent that year on research on these diseases. That is at the rate of 17 cents a death.

By contrast, $2.18 research money was spent for each of the 164,906 cancer deaths, $4 for each death for infectious disease other than infantile paralysis, and $525 for each of the 1,026 infantile paralysis deaths that year.

A concerted program for an all-out fight on diseases of the heart and blood vessels, comparable to the programs for fighting cancer, tuberculosis and infantile paralysis, has not yet got under way. Individual scientists or groups of them are working on various parts of the problem, such as diabetes, gout, kidney disease, high blood pressure and emotional and mental strains, all of which may affect the health of the blood vessels and heart.

From one of these groups of researchers, Drs. R. D. Taylor and Irvine H. Page, of the Lilly Laboratory for Clinical Research at Indianapolis, has recently come a yardstick for predicting death from apoplexy in persons with high blood pressure.

Grim foreboding though this may be to some, establishment of the yardstick, if confirmed by further studies, may open the way to a more direct search for methods of preventing death from cerebral hemorrhage. It will, moreover, offer comfort and assurance to those who probably will not die of apoplexy, even though they have high blood pressures.

The yardstick applies only to persons with high blood pressure of the type doctors call essential hypertension. It consists of five signs: severe headache at the back of the head or the nape or scruff of the neck; vertigo (dizziness) or fainting spells; motor or sensory neurologic disturbances such as memory defects, loss of ability to speak, and numbness or tingling; nosebleeds; and retinal hemorrhages without papilledema or exudates which the physician can determine from examining the eyes.

Apoplexy may strike, suddenly and fatally, in a person otherwise in apparently good health. If, however, any four of the above five signs appear in a person with essential hypertension, Drs. Taylor and Page state from their findings, it may be assumed that the patient will die of apoplexy within eight-tenths of a year to five years or, on the average, within 2.1 years.

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CARTOGRAPHY

Spherical Maps Save Space, Can Be Turned Quickly

➤ A GLOBE which can quickly and easily be turned with the finger tips to any desired position, and a nesting series of concave and convex spherical maps, arranged on frames which swing about a central axis, are increasing the usefulness of maps presented on a curved surface.

A new type of mount, which makes it easy to swing the globe about any one of three axes, eliminates the large amount of space needed for a globe set in the middle of the floor, and makes it possible to have built-in globes in classrooms, board rooms and offices.

A five-foot globe weighing several hundred pounds may now readily be turned to any desired position with little effort by means of the mechanical mount developed at the Science Museum of St. Paul, Minn. And polar areas, which were inadequately represented in the traditional axis and ring globes, may be carefully studied by those interested in air routes.

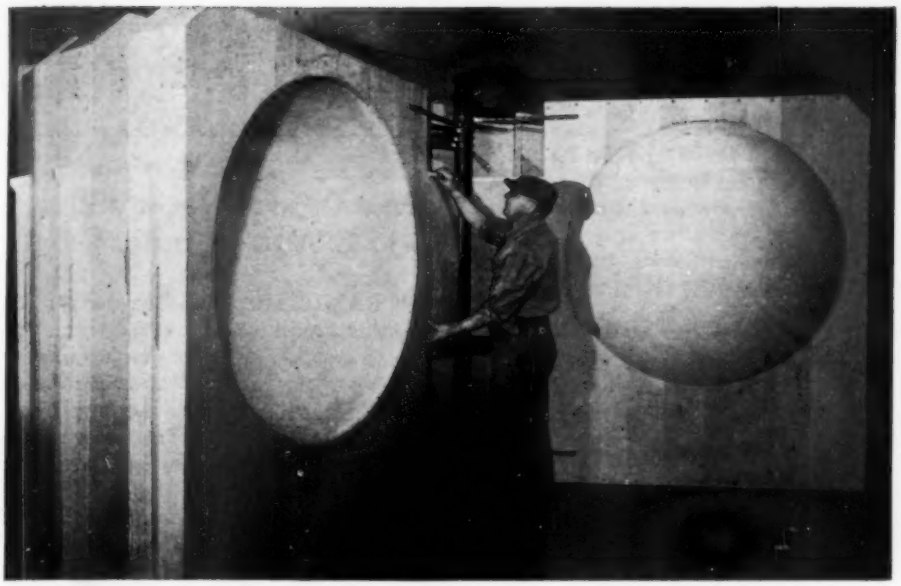
An atlas of spherical maps, some convex and some concave, arranged on frames which swing about a central axis, has made it possible to display a series of spherical maps without occupying too much space. The maps fit into each other and both the inside and outside of the sphere are used.

From the observer's standpoint, the chief advantage of concave maps is that he is looking at the inside of the bowl, and the map swings about him instead of curving away from his line of sight, states Dr. Louis H. Powell, director of the Science Museum.

"In its pioneering map exhibits dealing with national security, the first of which appeared in April, 1941," reports Dr. Powell, "the Science Museum abandoned at the start all attempts to represent the earth on flat planes and has used exclusively globes, segments of globes and concave spherical maps."

As long as one cannot see the entire surface of a globe at one time, a spherical segment of the globe is just as useful for most purposes as the globe itself. Most

EASILY TURNED—Large globes weighing several hundred pounds may readily be turned to any desired position. A recessed globe which can easily be oriented about any one of three axes is shown being used by a schoolboy.



SPHERICAL MAPS—A nesting series of concave and convex maps, arranged on frames which swing about a central axis, is being completed. Such an atlas of spherical maps will be used by the Science Museum in St. Paul to show the course of the war.

of the Museum's map displays have used large circular segments of globes, which in their entirety would be over 10 feet in diameter. Most globes lose part of their usefulness by being too small.

Since large globes will not go through the average doorway, the globes are cast in separable hemispheres. The Science Museum has successfully evolved a method of casting hemispheres and globe segments in basin molds prepared on a plaster-of-Paris master form.

The globes and spherical maps are made of a papier-mache composed of small squares of brown paper dipped in a dextrin-tempered plaster mix. The smooth surface is obtained during casting by brushing in a thin layer of the soft casting medium before laying the paper. The maps are reasonably durable and the material not particularly affected by atmospheric changes.

Due to these developments, the use of large globes is becoming increasingly practical. The Navy ordered 40-inch black-board-surfaced globes for training aerial navigators. And the blackboard-surfaced globes with and without the mechanical mounting are already being used in schools, colleges and by airlines so that people can trace their real or imaginary trips on a globe which truly represents the curvature of the earth.

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ENGINEERING

Engineering Guidance

➤ AFTER seeing the miracle which has been performed by American industry during this war, South American young men are turning to the United States rather than Europe for engineering educations, Anibal Santos, formerly mechanical engineer of Empresa Electrich del Ecuador, Inc., Guayaquil, Ecuador, and now associated with the Combustion Engineering Company, reported at the meeting of the American Society of Mechanical Engineers. Only recently have South Americans begun to study engineering in North America, he pointed out.

The problems faced by American engineers in Latin America are complicated by the fact that there are relatively few technical men there, as compared with the legal and medical professions, Mr. Santos stated. It was not until recent years that South America began to think of industry and manufacturing, and therefore until recently there was little interest in the engineering profession.

Praising the Good Neighbor Policy, Mr. Santos declared that there is still much more to be accomplished. Closer intermingling with local people and familiarity with the languages of the country will be helpful in better understanding, he predicted.

Winning Good Will

➤ ACCEPTING speaking engagements to tell Brazilians about life in America, familiarity with Brazilian labor laws, import regulations, knowledge of the country's trade journals, a willingness to give technical help, were among the means suggested to the meeting by Chandra R. Saksena, of Rio de Janiero, to win the good will of Brazil and its people.

Addressing his remarks to Americans who expect to engage in industrial and business enterprises in Latin America, he pointed out a number of do's and don'ts to observe while in Brazil. We must remember, he stated, that Brazil is a new and rapidly developing country. It lacks the complex organization of the United States and other older nations. Brazil's Latin cultural background naturally presents a pattern of different habits and customs.

He also suggested that Americans refrain from meddling in politics or religion. "We have a good motto which we tell all our foreign friends as they arrive," he stated: "If you want to keep out of trouble, keep out of politics."

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MEDICINE

Anti-Germ Activity Found In Buttercup Juice

➤ THE POSSIBILITY of a remedy like penicillin being developed from buttercup juice appears in a report by Dr. Beatrice Carrier Seegal and Dr. Margaret Holden, of Columbia University College of Physicians and Surgeons in *Science,* (April 20.)

Growth of streptococci, staphylococci, pneumonia, anthrax and tuberculosis germs and a number of other microorganisms that cause sickness in humans was stopped by juice pressed from buttercup leaves, stems and blossoms. A steam distillate of this pressed juice was also effective. Anemone juice gave similar results.

The use of the buttercup juice as a remedy in infections was prevented by its toxicity for laboratory animals. The distilled juice is less poisonous than the whole juice. Chemical methods are now being developed, the scientists report, in an effort to separate the poisonous from the anti-germ substances.

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MILITARY SCIENCE

Rockets Add Their Force To Palawan Bombardment

See Front Cover

➤ ROCKETS STREAK out from a vessel of the Seventh Fleet, as shown in the official U. S. Navy photograph on the front cover of this SCIENCE NEWS LETTER, to add their force to the bombardment which blanketed the shore near Puerto Princessa in smoke.

The action took place on Feb. 28 when troops of the Army's 41st Division were landed on Palawan by the Seventh Fleet in another of the series of sure and well-timed strokes which has marked the Philippine campaign.

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ETHNOLOGY

Werewolves on the Loose In Germany, Nazis Say

➤ THE WEREWOLF is on the loose again in Germany, according to Nazi propaganda, to raise a reign of terror in the Fatherland for Germans who accept office in conquered territory under control of the Allies, and for Allied soldiers caught off guard within the Reich. The werewolf of medieval days was only a superstitious belief; the present werewolves are members of an underground party, and are real, the Nazis say, and they will strike with suddenness and without warning.

The werewolf of medieval days, also called the werwolf or the wehrwolf, was a person who, according to the superstitions of the time, was able at will to assume the body of a wolf, retaining, in part at least, the human mind, but taking on the beast's cunning, strength, savagery, and desire for human flesh. He assumed the form of the beast usually at night, and then preyed on wanderers in lonely places to satisfy his cannibalistic taste for human flesh.

Belief in werewolves was common in much of Europe. The were-jaguar was a similar superstition among the Indians of the Amazon basin. Other peoples believed in the were-bear, were-tiger and were-hyena.

The word werewolf means literally man-wolf. In Norse it was vargulf, meaning a wolf worse than any other kind of wolf. Perhaps this is the name the Nazi underground should have adopted. Scientists explain that the werewolf superstition is a belief in lycanthropy, the power which some persons were supposed to have of becoming wolves, or, in some regions, the fiercest animal existing there. The basis of the superstition is the belief in transformation, but its special form is due to mental aberration, persons of diseased minds imagining they were wolves and, acting as such, preying on other humans.

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MEDICINE

Link Between Kidney And Ovarian Functions

➤ EXISTENCE of a hitherto unknown action of female sex hormones, which may be responsible for certain disorders of women, is indicated by experiments which Dr. Kurt A. Oster, director of the department of pharmacology in the research laboratories of McKesson & Robbins, Inc., reports in *Endocrinology*.

The experiments have demonstrated for the first time that there is a definite link between the kidney and ovarian functions, a fact often suggested by physicians who noted changes in the function of the kidney in the menstrual cycle and especially during pregnancy, the report reveals.

By using a stain with a specific affinity for a particular group of organic chemicals, Dr. Oster demonstrated that these substances occur in the normal kidney in a clearly defined distribution pattern. He found that the kidney exhibited varying degrees of staining in four zones which parallel the functional units into which physiologists have divided the kidney, and that the intercortico-medullary or ICM zone tends to lose and then regain its deep staining quality in synchronization with the cycle of the egg in the ovary.

During pregnancy, the stain disappears from this kidney zone almost entirely, and with the resumption of the normal ovarian functions, the cyclic nature of the staining returns, he found.

Dr. Oster concluded that this phenomenon indicates a disappearance and reappearance of a chemical in the kidney cells, rather than an alteration of cell structure, since a structural change can be demonstrated with ordinary staining methods.

Preliminary experiments conducted by Dr. Oster indicated that ovarial hormones alone are responsible for the change in the kidney.

The studies described in the paper have been going on in the McKesson laboratories for nearly two years under the direction of Dr. Oster with the assistance of Miss Jean G. Baum.

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IN SCIEN

HORTICULTURE

New Orange Variety Ripens 5 to 8 Weeks Earlier

➤ ORANGES from Florida may reach Northern markets a month, or even two months, earlier than they now do, once a new variety on which U. S. Plant Patent 657 has been issued becomes more widely propagated. The new variety originated as a bud sport in the top of a tree of one of the standard orange types, in the grove of the late Harold E. Cornell of Winter Haven. He propagated it by grafting, and since his death his widow, Mrs. Thelma Cornell, has carried on the work.

The one thing that distinguishes this tree in appearance is a tendency to thorniness; the fruits, medium to large in size, look and taste very much like other high-quality oranges. But they have the great advantage of ripening from five to eight weeks earlier than any other known Florida orange variety.

Science News Letter, April 28, 1945

ANIMAL HUSBANDRY

Hens Lay Better In Artificial Light

➤ ARTIFICIAL light in the henhouse means more money to the farmer, experiments in the poultry department at Cornell University indicate.

Tests for the first year show that 125 pullets of high-producing strains receiving artificial light produced 26,085 eggs, or 2,757 more than the same number of pullets without lights. Eggs from the former sold at retail for $1,045, or $45 more than for the latter. The additional income from each pullet was $1.

One flock received no light in the 13-month test period, and the other was lighted from Sept. 15, 1943, to April 25, 1944, and again from Aug. 15 to Oct. 15, 1944.

The lighted flock laid 3,260 more eggs than the unlighted one from September to April, when egg prices are higher, but 503 fewer eggs during the rest of the period. Part of this difference, according to F. E. Andrews of the poultry staff, was due to a somewhat higher mortality in the unlighted flock during the early part of the laying year.

Science News Letter, April 28, 1945

ENCE FIELDS

BIOCHEMISTRY

Fungus Found to Be Source Of Vitamin B Complex

➤ A FUNGUS that causes one of the most destructive of plant diseases, flax wilt, has been found to be a potential source of most of the B vitamins, in researches by a four-man team in the laboratories of Fordham University.

The fungus, known to botanists as *Fusarium lini,* was grown in quantity on a stock culture medium containing glucose. The matted growth was ground up after being dried, and added to a vitamin-deficient diet fed to rats. It was found necessary to add thiamin (vitamin B_1), but the dried mold-like substance proved an adequate source of other vitamin B constituents, "comparing favorably with brewer's yeast."

Collaborating in the research, which is reported in *Science* (April 13), were Leonard J. Vinson, Prof. Leopold R. Cerecedo, Robert P. Mull and F. F. Nord.

Science News Letter, April 28, 1945

ENGINEERING

Color Speeds Production Of Army's B-32 Dominator

➤ THE ARMY'S new B-32 Dominator superbombers are flying into the blue skies at an increasing pace as the result of color control systems on the assembly lines that improve the safety features and operating ease of many machines at Consolidated Vultee Forth Worth plant.

All machines in the entire plant are painted a sea-water green that is easy on the eyes and makes the production areas seem more cheerful to workers. Working areas on the machines are all painted yellow, so that when a plane builder sees a yellow section on a machine he knows that it contains moving parts of which he must beware when the machine is in operation. Red paint is used on all electrical switches and buttons that control the machines.

In addition, each one of the ten work stations along the assembly line is designated by a different color. The color for each station is clearly shown by a color control board, showing work to be performed, hung beside the plane itself. Thus a continual visual reminder is provided of every job to be performed and who is to do it. The boards are made up of small removable strips of paper on which information is printed so that as assembly instructions change, the color boards can be kept up to date.

Employees, too, are aided by the color system. Accustomed to the color boards, they waste no time in trying to determine just where station No. 1 or No. 6 or No. 10 might be. All they need do is glance at the board.

Science News Letter, April 28, 1945

GENERAL SCIENCE

Drafting Young Scientists Endangers War Effort

➤ DRAFTING the country's younger scientists away from their laboratories and classrooms to throw them into action as combat troops endangers both the present war effort and the postwar job program, warns the American Association of Scientific Workers in a statement issued under the signature of Dr. Harry Grundfest of Princeton University.

The Association's protest is provoked by the recently established Selective Service policy, of reclassifying research students and laboratory workers in the 18-to-30 age group and inducting them into military service. It is also expected that the 30-to-38 age group will be called up soon.

The Association's statement comments:

"Unless these steps are halted, scientific personnel on college staffs and on research projects of less immediate importance to the prosecution of the war will shortly be swept into the armed forces. In terms of manpower, the total number of people involved is small. Induction or deferment of these groups can do little, therefore, to affect the requirements of the armed forces.

"In terms of the loss to society and to science, however, the induction of these younger scientists will bring about a grave situation. It will deprive society and science of a group which is probably at the height of its originality and promise. It will furthermore seriously curtail the teaching facilities of the colleges, and thus bring about a still greater deficit in the postwar supply of scientists."

Officers of the Association have made representations to War Manpower Commissioner McNutt, Selective Service Director Hershey, and to various scientific bodies. They have also issued a general call to scientific societies, to colleges and universities, and to individual scientists, to make their protests felt.

Science News Letter, April 28, 1945

RESOURCES

Present Supply of Kapok Will Be Gone in 8 Months

➤ LIFE JACKETS and life preservers used by the armed forces and merchant marine will soon be packed with a new fibrous glass material as the 10,000,000-pound stockpile of kapok, and substitutes such as milkweed fiber and Ecuador kapok, threatens to become depleted by the end of this year, reports the U. S. Coast Guard.

Selected as the best substitute for kapok life-jacket filler after exploratory tests had been conducted on a number of materials at the Mellon Institute of Industrial Research, fibrous glass has many superior qualities. It is fireproof, more resistant to being packed down under compression, and does not absorb water as rapidly as kapok.

Before the war, America imported up to 10,000 tons of kapok annually. Most of it came from Java, and this source of supply was cut off when that country was invaded by the Japs. A soft, fluffy fiber, kapok is secured from the pods of the bombax tree. The clumps of fiber were removed from mature pods, cured in the sun and compressed into bales by native labor.

Science News Letter, April 28, 1945

RESOURCES

Mountain Leather May Have Many Commercial Uses

➤ MOUNTAIN leather, a type of asbestos that has been only a museum curiosity in the past, is now found adaptable to industrial uses, particularly in filtering, sound-proofing and shock-absorbing materials. A deposit of limited size has been discovered near the entrance to Glacier bay, Alaska, and experiments, conducted by the U. S. Bureau of Mines, give promise of possible wide commercial uses.

This native material is known to geologists as paligorskite. When dry it is light in weight, tough, resembles buckskin, and tears somewhat like heavy cardboard. Upon wetting, it absorbs considerable water, swells and becomes soft, can be torn easily, resembles paper pulp, and is slimy to touch. In this condition it can probably be converted to a pulp in conventional paper-mill beaters, and then formed into many lightweight, acid- and fire-proof products.

A special report on mountain leather and its possible uses has been issued by the Bureau.

Science News Letter, April 28, 1945

ASTRONOMY

Lion Now High in Sky

This constellation shines high in the southwest on May evenings, made even more conspicuous than usual by presence in it of the bright planet Jupiter.

By JAMES STOKLEY

➤ HIGH in the southwest on May evenings shines the constellation of Leo, the lion, made even more conspicuous than usual by the presence in it of the bright planet Jupiter. This exceeds in brilliance the star Regulus, brightest permanent member of the group. Jupiter is now of magnitude minus 1.8, which is some 17 times that of Regulus.

A part of Leo that is characteristic is the so-called "sickle" with Regulus at the end of the handle, the point of the blade curving toward the western point of the horizon. To the left of the sickle is a triangle of stars which is supposed to mark the lion's hindquarters. The easternmost of these is called Denebola, a corruption of an Arabic name meaning the lion's tail. The line of stars that comes down towards Jupiter marks one of the animal's hind feet, so the planet is an extra object in this part of his anatomy.

Next to Leo, to the east, is Virgo, the virgin, in which Spica appears. This group, and its neighbors, are all shown on the accompanying maps, which depict the skies about 11:00 p. m., your local war time, on May 1, and about 10:00 p. m. in the middle of the month.

Atmosphere Absorbs Light

Another first magnitude star in the southern sky is shown in Bootes, the bear-driver, which is above the easternmost end of Virgo. Low in the southeast there is indicated a part of Scorpius, and the star named Antares. This is one of the first magnitude also, but the symbol used for it on the map is that for the third. The reason is that it is so near the horizon that much of its light is absorbed by the earth's atmosphere, dimming it considerably. A few months from now it will be higher in the evening sky, and then it will be seen in full brilliance. Even in May it can be seen as high and as bright —in the early morning hours.

In the northern half of the sky some more first magnitude stars and another planet are shown. Saturn is the planet, low in the northwest, in the figure of Gemini the twins where we also see the star Pollux. To the right of Gemini is Auriga, the charioteer, with Capella. In the northeast there is Vega, in Lyra, the lyre; and Deneb, in Cygnus, the swan, also dimmer than it should be because of its low altitude. In the evenings of coming months these last two figures will get higher, and their stars brighter, while those in the northwest will then be gone from view for a while.

The big dipper, part of Ursa Major, the great bear, is now in nearly its best evening position of the year, high in the north. The "pointers," part of the dipper, show the direction to Polaris, the pole star, and the little dipper, which extends upward from it. Winding around the little dipper, from a position close to the pointers, is Draco, the dragon, which can also be seen well on May evenings.

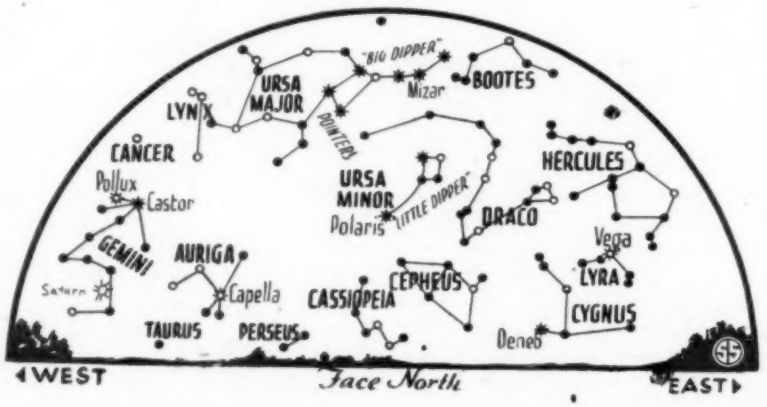
Low in the east, just before sunrise, two other planets may be seen. Venus, which was so brilliant in the western evening sky during the past winter, has shifted to be a morning star, and it is easily found in the morning twilight. By the end of the month it will be about 18° above the horizon at sunrise. On May 21 it will be at maximum brightness, minus 4.2, which is nearly ten times as bright as Jupiter. Mars also is seen in the east, about 18° above the horizon at the beginning of the month, and is of magnitude 1.3, the same as that of Regulus. Mars and Venus will draw closer and closer together until, early next month, they will be about 5° apart (which is a distance about 10 times the diameter of the full moon). Then they will separate again. Mercury also will come into the morning sky about May 11, but hardly enough to be seen, for even then it will rise less than an hour before the sun, and will be lost in his glare.

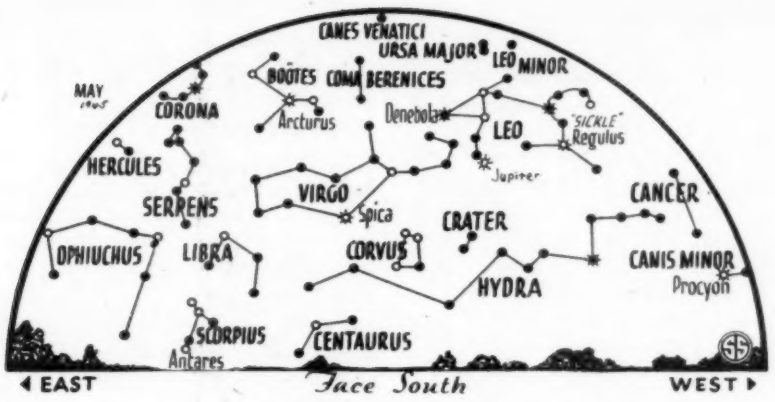
Directly overhead at the times for which our maps are drawn, there stands the constellation of Canes Venatici, the hunting dogs, one of several new figures added in 1690 by the Polish astronomer Johannes Hevelius, of Danzig, to fill some areas where the ancients had not bothered to put constellations. The brightest star in this figure, which stands at the approximate center of the arc of the circle formed by the great dipper, is called Cor Caroli. This was so named in 1725 by Edmund Halley, of comet fame, who was astronomer royal of Great Britain, in honor of Charles II. In doing this he followed a suggestion of the court physician, Sir Charles Scarborough, who said that it had seemed to shine with special brilliancy on the night of May 28, 1660, the eve of the king's return to London upon the restoration of the Stuarts after Cromwell had been overthrown.

Spiral Nebulae

Looking at this constellation with a telescope, a misty spot is seen near the star Alkaid, the one at the end of the handle of the great dipper, and a long-exposure photograph through a great observatory instrument shows it as having the appearance of a Fourth-of-July pinwheel. It is one of the finest of the spiral galaxies (formerly called spiral nebulae, before their nature was understood). Actually it is a vast assemblage of stars similar to that of which our sun and all the stars of the nighttime sky are part, and which make up the Milky Way Galaxy.

This region of the sky—Canes Venatici, and Coma Berenices, next to it—is particularly rich in these objects. The





☼ ✹ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

Milky Way itself, where all other types of heavenly bodies are most numerous, is devoid of them. This was very puzzling to earlier generations but now we appreciate the reason. Our galaxy is a flattened disk of stars. As we look toward the edge of the disk we see many more stars than we do toward the flat sides, and this concentration of stars produces what we call the Milky Way.

Naturally, all the bodies that are members of our galaxy are most numerous in the Milky Way but they, and the clouds of dark matter that accompany them, obscure what lies beyond and is outside our galaxy. Consequently, external galactic systems, of which the one in Canes Venatici is a good example, are best seen toward the poles of the Milky Way, for in these directions there is less matter in the foreground to interfere. Millions of these other galaxies are known, and when the 200-inch telescope at Mt. Palomar is in use, a year or two after the end of the war makes possible resumption of work on it, still vaster numbers will be revealed, and nearer ones will be seen better, adding to our knowledge of these "island universes."

Celestial Time Table for May

May	Ewt	
4	Early Morning	Meteors of eta Aquarid shower visible
5	2:02 a. m.	Moon in last quarter
8	Noon	Moon passes Mars
9	6:53 a. m	Moon passes Venus
10	2:00 p. m.	Moon nearest, distance 223,200 miles
11	8:00 a. m.	Mercury farthest west of sun
	4:21 p. m.	New moon
14	10:31 p. m.	Moon passes Saturn (in the southwestern part of the country Saturn will be occulted or "eclipsed")
18	6:12 p. m.	Moon in first quarter
20	6:53 a. m.	Moon passes Jupiter
21	11:00 a. m.	Venus at greatest brilliance
22	9:00 p. m.	Moon farthest, distance 252,000 miles
26	9:49 p. m.	Full moon

Subtract one hour for CWT, two hours for MWT, and three for PWT.

Science News Letter, April 28, 1945

MILITARY SCIENCE

Underground Factories

Many of them have been discovered by Reds in liberated areas. Using idle mines for war purposes was suggested by a German magazine a decade ago.

▶ A SECRET Nazi underground is offered as a postwar threat, but an extensive German underground factory force has been hard at work since early in the days of Allied air invasions and has produced great quantities of war material in well-equipped industrial plants in former coal, iron and salt mines, and in underground caverns excavated for this single purpose.

How many of these underground factories there may be, and how great their output, is unknown, but Soviet soldiers have discovered a considerable number in liberated and German areas. Information about some of them is given in a recent official information bulletin issued by the embassy of the Union of Soviet Socialist Republics.

The largest underground enterprises were discovered in German territory in a forested area, the report states. It was a huge plant for the assembling of aircraft, a branch of one of Germany's largest airplane manufacturers. When taken, everything was in perfect condition, undamaged by the hurriedly retreating workmen and Gestapo watchmen.

In the Budapest area in Hungary, a vast aircraft engine plant was discovered in ancient and little-known catacombs which extend a distance of some three miles. The engines were for a Messerschmitt factory, also located in the Budapest area. In the Poznan (Posen) area in Poland, underground shops were built by the Germans in the forts of an old fortress. Many of these forts had gigantic underground edifices two and three stories deep. Factory equipment evacuated from Bremen was installed in them.

These are but a few of the underground factories and storage places found by the Reds. Many others were discovered in France by the Allies, and more are now being located by Americans and British in Germany itself. The use of the salt mine at Merkers for the storage of German gold and works of art is another example of the German use of bombproof underground storage.

The military use of idle mines for

A king's ransom —paid in pepper!

IT IS STRANGE but true, that after Alaric took Rome, he exacted a tribute, not only of gold and silver, but of 2,000 pounds of pepper! This is one of hundreds of fascinating stories told by Anne Dorrance in her book about the transportation of seeds and plants from their original homes to the four corners of the earth. Grains, spices, rubber, quinine, fruits and vegetables have all made history in unsuspected ways. Here's the whole story, fascinatingly, and authoritatively told.

GREEN CARGOES

By ANNE DORRANCE

At your bookseller's • $2.00

DOUBLEDAY, DORAN

Do You Know?

Though *acacia gum* can be used for food it has but little nutritive value.

New U. S. *battleships* have 50 complete separate cooling systems.

Next to oxygen, *silicon* is the earth's most abundant element.

There are no unrationed *foods* in Japan.

Walnuts have been found around the Swiss lake dwellings of the Neolithic Age; date, 7000 B. C.

The outlook is good for seeds, fertilizers and insecticides for 1945 *Victory gardens.*

North America has over half the world's known supply of *bituminous coal.*

Very fine *garnet powders* are now being used in optical glass polishing because of the war shortage of corundum.

The Texas *nighthawk* is the most northern member of a tropical species that ranges widely through Central and South America.

Titanium and zirconium, best known for their alloys with steel, are also used to alloy with copper, producing a substance comparable with tin bronzes.

Phosphorus burns are treated successfully with a solution of 1% permanganate of potash and 3% bicarbonate of soda, it is reported.

Porcelain *enamel* can be called a glass-metal combination, that is, metal coated with glass for its protection and decoration.

Eggs, coated with a film of highly refined, colorless, paraffin-base oil, may be preserved for months at 31 degrees Fahrenheit.

The speed of *sound* is somewhat less at high altitudes than at the surface of the earth because of the lower temperature and lower air density.

Termites that feed on wood are able to do so because they have within them one-celled animals known as flagellates that live in their intestines and digest the wood for them.

From Page 267

storehouses of war equipment and for underground factories was suggested in 1935 by a German magazine, the report states. Before the war the foreign press frequently mentioned German construction of underground stores, oil dumps and hangars. The new structures were built by one organization and with a uniform plan. These were operated by forced labor from overrun countries and controlled by the Gestapo.

Science News Letter, April 28, 1945

CHEMISTRY

Tent Cloth Wears Longer, Has Greater Strength

▶ TENT CLOTH has been developed which, through the use of new synthetic resins, wears longer, has greater strength, and resists weathering and fungi better than prewar duck.

The compound in which the cloth is bathed makes it waterproof by sealing the relatively open weave. By acting as a binder and carrier for the flame-proofing and fungus-resisting agents, it protects the cloth against fire and deterioration.

A group of resins known as the paraplexes were used to coat the canvas, which remains flexible at sub-zero temperatures. These resins, one of a group of tacky, adhesive resins made from unsaturated fatty acids and glycerol, are more rubbery and non-oxidizing than the oil-modified type.

A rosin-modified phenolic resin was used to carry the pigment. It possesses a high melting point, intrinsic hardness, and releases solvents rapidly, of particular importance to the manufacture of tent cloth.

In all, over ten different ingredients were used in carefully controlled quantities.

In the early stages of the war, mildew destroyed one-fifth of all fabrics shipped to the South Pacific. The wide range of weather and service conditions found in various theaters of war called for a material that would remain flexible at sub-zero weather, be completely water- and weather-proof, and retain color well. Already familiar with synthetic resins from their earlier experience in making book cloth and artificial leather, the L. E. Carpenter Company, with the cooperation of the Resinous Products and Chemical Company, devised a coating compound for tent cloth that would fill the bill.

By unrolling the fabric as it comes from the textile mills and stitching the end to another roll, a continuous coating operation has increased the output 40%.

Science News Letter, April 28, 1945

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BOTANY

NATURE RAMBLINGS

by Frank Thone

See and Shun!

➤ POISON IVY victims begin to become numerous at about this time of year, and they will continue so until frost strips the wicked vine of its foliage. It is sometimes stated that poison ivy is at its most virulent when in bloom; but most of the afflicted ones can find no seasonal differences in their miseries. Just as many blisters and as much itching in August as in May, they declare.

The malaise of ivy poisoning—ranging from relatively mild discomfort in some to acute and prolonged suffering in the more sensitive—can be largely obviated by attention to a few simple precautions. As in all afflictions, prevention is better than cure, and avoidance of the cause is the key to prevention. Learn to recognize poison ivy at sight, and keep away from it whenever you see it, and you will reduce the number of attacks per season—perhaps eliminate them altogether.

Poison ivy is easily recognizable by its three-parted compound leaf. It is the only abundant shrubby plant in the woods with that kind of leaf. Flowers are small, greenish-white, thickly clustered; they are followed by berries that become a slightly soiled parchment-white when ripe.

For the Eastern species, there is no valid distinction between poison ivy and poison oak, which is sometimes attempted on the basis of leaflet-shape. Leaflet margins range all the way from entire to deeply notched or lobed—sometimes on different parts of the same vine. Poison ivy is an exceedingly variable species. The name poison oak is properly applied to the Western species, which is plentiful in the foothills of coastal mountain ranges, and is also found less abundantly inland.

Properly speaking, poison ivy is a vine. In humid woodlands it climbs trees and clambers over rocks and stone fences, clinging by means of innumerable aerial roots. In slightly drier terrain, it disguises its character by running the main stem of the vine along or just under the ground surface, sending up numerous branches that range from a few inches to four or five feet in height, so that it is often described as a shrub. But it's all the same old pesky poison ivy.

Several hundreds of remedies for ivy poisoning have been proposed, almost all of them completely worthless. A few years ago U. S. Public Health Service scientists developed an ointment containing 10% sodium perborate and 2% potassium periodate in a cold cream base, which is said to be very effective in most cases.

There is also a good preventive treatment, which persons who know themselves to be susceptible can put on before going into the woods. It consists simply of a 5% solution of ferrous sulfate in a half-and-half mixture of water and ethyl alcohol; a little glycerin may be added to keep it from feeling too dry as it evaporates on the skin.

Science News Letter, April 28, 1945

WITHOUT BALCOTE
Before the application of Balcote to a lens system in a camera or binocular, light striking the lens often obscured the scene. This picture was taken through a standard B&L uncoated lens. The best possible print was made from the negative this secured.
WITH BALCOTE
A Balcote surfaced lens under identical conditions reveals the scene sharply, clearly, and with greater brilliance. This picture, taken through the same type B&L lens with Balcote finish, was given identical exposure and development. Note the detail and clarity in the print from this negative.

Valentino Sarra made the above two photographs with two cameras with simultaneous and equal exposure

"*Balcote*" Revolutionizes Optical Science

To build lens systems that would let more light through . . . that would eliminate the light loss and the "flare" caused by internal reflections . . . that would give sharper, clearer, more brilliant images . . . has been the objective of scientists for years.

Long before the war, Bausch & Lomb had developed methods of coating lenses to reduce reflections and permit the passage of more light. As a result, Bausch & Lomb, in 1939, introduced B&L Super Cinephor Projection Lenses with antireflection coatings. These lenses were used in projecting the Technicolor motion picture, "Gone With The Wind." They passed 30% more light, made possible the richer, deeper colors on a larger screen.

A further improvement of this same coating, today known as *Balcote* and recognized as among the best and most permanent available, is used on B&L Photographic Lenses, other military optical instruments, and wherever light transmission is a problem. In wartime binoculars, the use of *Balcote* has meant an increase of as much as 54% in brilliance. Bausch & Lomb Optical Co., Rochester 2, N. Y.

BAUSCH & LOMB

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• Books of the Week •

➤ WITH THE WAR nearing its end, thoughtful men are looking ahead to the struggle that must succeed the military phase: the great effort needed to keep the peoples of the world fed and clothed, that peace may last and chaos be avoided. Prof. Karl Brandt of Stanford University boldly tackles the toughest of the post-war problems in RECONSTRUCTON OF WORLD AGRICULTURE (*Norton*, $4). Major attention is focussed (as perhaps it should be) on Europe; though other regions are not neglected. Like most mature economists, the author holds to a liberal doctrine.

Science News Letter, April 28, 1945

➤ MUMMIES, by Richard A. Martin, is the newest addition to the Field Museum's interesting and well-illustrated series of pamphlet publications. It is much livelier than its title might seem to indicate. (*Chicago Natural History Museum*, 25c.)

Science News Letter, April 28, 1945

➤ WEATHER AND CLIMATE have assumed larger importance in everyone's eyes since the war has forced a wider world consciousness upon us. It is safe to predict that the many college courses in these subjects that have been instituted will not all be abandoned. Which makes timely the coming of a competently written text and reference book like CLIMATOLOGY, by Bernhard Haurwitz and James H. Austin (*McGraw*, $4.50).

Science News Letter, April 28, 1945

➤ METHODS IN CLIMATOLOGY is a text for the training of the new generation of researchers in that subject which the postwar world is going to need. Some knowledge of mathematics (but not too much) is prerequisite to work with this book. (*Harvard*, $4.)

Science News Letter, April 28, 1945

➤ FORESTRY has long been an important profession in the United States; in postwar times it must become more important still, if this country is to maintain its position in the world. In YOUR FORESTS, Martha Bensley Brüere presents a strong appeal for the expansion of the American conservation policy, and at the same time presents the facts and problems of forestry in such a way as to make a strong appeal to young people. (*Lippincott*, $2.50.)

Science News Letter, April 28, 1945

➤ CATTLE BREEDING is still a good deal of a mystery to many farmers who must needs practice it. With the laudable aim of making the biological processes involved more comprehensible, James E. Russell presents, in HEREDITY IN DAIRY CATTLE, a simple, practical text that can be used with or without benefit of classroom presentation. It is intended particularly for use by 4-H and FFA dairy clubs. (*American Guernsey Cattle Club*, $2.50.)

Science News Letter, April 28, 1945

➤ NAVAL EVENTS crowd upon each other's heels so fast in time of war that even the latest books in the field of naval construction and strategy are a bit "dated" by the time they can appear in print. Such a fate has overtaken BRASSEY'S NAVAL ANNUAL for 1944, in which events down to the end of 1943 are chronicled. Despite this handicap, however, the book is a "must" for any library that pretends to completeness in its field. (*Macmillan*, $5.)

Science News Letter, April 28, 1945

➤ CALIFORNIA'S tremendous variety of topography and climates greatly complicates the task of anyone who undertakes the study of animal and plant distribution in the state. Zoologists generally and ornithologists in particular will long be grateful debtors to Joseph Grinnell and Alden H. Miller, who in THE DISTRIBUTION OF THE BIRDS OF CALIFORNIA give exact and well-documented data, species by species, supplemented with numerous maps. (*Cooper Ornithological Club*, Berkeley, $7.)

Science News Letter, April 28, 1945

• Just Off the Press •

ANNUAL FLOWERS FROM SEED PACKET TO BOUQUET—Dorothy H. Jenkins—*Barrows*, 223 p., illus., $2.75.

CARNEGIE INSTITUTION OF WASHINGTON, Year Book no. 43, July 1, 1943 - June 30, 1944—*Carnegie Inst.*, 206 p., illus., paper, $1; cloth, $1.50.

THE CHEMICAL PROCESS INDUSTRIES—R. Norris Shreve—*McGraw*, 957 p., illus., $7.50.

COMPARISON OF CLIMATE OF THE UNITED STATES AND EUROPE WITH SPECIAL ATTENTION TO POLAND AND HER BALTIC COAST — Wladyslaw Gorczynski — *Polish Institute of Arts and Sciences in America*, 288 p., illus., $5., (Polish Institute Series no. 7).

THE DYNAMICS OF CULTURE CHANGE, an Inquiry into Race Relations in Africa—Bronislaw Malinowski—*Yale Univ. Press*, 171 p., $2.50.

FUNDAMENTALS OF PHYSICS AND THEIR APPLICATIONS IN MODERN LIFE—Bowen C. Dees—*Blakiston*, 486 p., illus., 69c.

HUMAN NATURE AND ENDURING PEACE, Third Yearbook of the Society for the Psychological Study of Social Issues—Gardner Murphy, ed—*Houghton*, 475 p., $3.50.

NATIONAL BUDGETS FOR FULL EMPLOYMENT—*National Planning Asso.*, 96 p., paper, illus., 50c, (Planning Pamphlets nos. 43 and 44).

NATIVE PEOPLES OF THE PACIFIC WORLD—Felix M. Keesing—*Infantry Jour.*, 134 p., paper, illus., 25c; for sale to members of the Armed Services only, (Fighting Forces Series).

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TANKS AND ARMORED VEHICLES—Robert J. Icks—*Duell*, 264 p., illus., $4.75.

TOWARD A PERMANENT PEACE—*American Nobel Center*, 93 p., paper, $1.

Science News Letter, April 28, 1945

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ENTOMOLOGY

Original Insect Wings May Have Been Misplaced Legs

➤ SUGGESTION of a solution for one of science's oldest riddles—Where did insect wings come from?—is offered by the appearance, in experimental colonies of fruit-flies maintained at the University of California, of insects with legs where their wings ought to be. An explanation of this sudden evolutionary change, or mutation, which is hereditary, is offered by Prof. Richard B. Goldschmidt in *Science* (April 13).

An especially interesting feature about the misplaced legs is that they are three-jointed instead of being four-jointed like normal insect legs. This fits in with a theory that has been advocated in the past, that insect wings, despite their apparent one-piece construction, are basically three-jointed appendages. It also lends support to the idea that at some time in the remote past, insect wings originated by an evolutionary transformation of legs.

Science News Letter, April 28, 1945

To hold their vitamin C, *carrots* must be kept both cold and moist.

NUTRITION

Vitamins for Doughnuts?

Vitamin loss in deep fat frying studied. Doughnut consumption on increase but number eaten is a factor in considering enrichment.

► DOUGHNUTS, with triple the popular appeal they had in 1929, seem now to be making a bid for favor on the nutritional score. That appears to be the story back of a scientific study of vitamin losses during deep fat frying reported by Dr. Gladys J. Everson and Dr. Arthur H. Smith, of Wayne University, Detroit. (*Science*, March 30)

When the Red Cross and other organizations hand out doughnuts and coffee to men in the armed forces, nutritionists wish they could give something as tasty and easy to serve that contained more vitamins and minerals. And nutritionists generally advise all of us to eat a better breakfast than one consisting solely of doughnuts and coffee. The doughnuts contribute calories for energy, but the doughnut and coffee breakfast is short of vitamins and minerals.

White bread for breakfast toast used to have the same nutritional fault of lacking vitamins and minerals. Now it is enriched by addition of three B vitamins, thiamin, niacin and riboflavin, and the mineral, iron.

Why not enrich doughnuts, too, is the question naturally asked by those who make them and those who like to eat them. One answer was that the deep fat frying by which doughnuts are made would cause a loss of thiamin, which does not survive heat well.

In a study supported by a grant from the Doughnut Corporation of America, Drs. Everson and Smith found that when doughnuts are made by the usual commercial process from enriched flour, which is one way of making enriched bread, there was lost 22.9% of the thiamin and 20% of the niacin but no appreciable amount of riboflavin or of iron.

Some thiamin is lost from bread in the baking. The average loss is about 15%, but the 22.9% loss reported for the doughnuts is within the range reported for thiamin loss in bread. Niacin, the pellagra-preventing vitamin, however, is not lost in the baking of bread as this vitamin stands up well under heat.

Waste of vitamins, because of the loss in processing, has been one argument against enriching doughnuts, crackers, cake, spaghetti and macaroni.

The number of doughnuts eaten by the average person also comes into the picture. Drs. Everson and Smith state that in 1929, according to sales records, 201 millions of dozens of doughnuts were sold. In 1943 the figure was 665 millions of dozens. In 1944 the Red Cross distributed 84,130,960 doughnuts, approximately, to members of the armed forces in all theaters. That is a lot of doughnuts, but if divided equally it would come to less than a dozen doughnuts a year for each GI. Similarly, the 1943 total gives one doughnut a week for each of the 130,000,000 or 140,000,000 persons in our population.

Even leaving out infants and non-doughnut eaters, some nutritionists think doughnuts do not constitute a large enough part of the daily diet to make enrichment advisable. The average person consumes much more bread than doughnuts daily, it is argued, so bread is considered the product to be enriched from the standpoint of improving national nutrition.

GI's and others in the services who may consume a large proportion of the 665 million dozen or more annual doughnut fry probably will continue to get their doughnuts, enriched or non-enriched, there being no satisfactory substitute. Maybe someone can work out a substitute full of vitamins in time for the next war.

Science News Letter, April 28, 1945

AGRICULTURE

New Weed Killer Is More Effective Than Oil

► A NEW chemical weed-killer has been developed at the University of California's College of Agriculture, Prof. A. S. Crafts announces in *Science* (April 20). It carries the rather long descriptive title of 2,4 dinitro 6 secondary butyl phenol. Emulsified with a little oil and a lot of water, it has been found very effective against weeds that resist the all-oil sprays now in general use. It is less inflammable and less expensive to transport than oil, and safer to use than arsenical weed-killers, in areas where livestock are pastured.

Science News Letter, April 28, 1945

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•New Machines and Gadgets•

❁ *OUTLINES on drawings in a child's paint book help prevent the overspread of the colors by an ingenious method. The lines are printed in ink and resin is applied to the wet ink. If then heated, the lines swell or puff up, forming barriers or dams between the various sections of the drawing.*

Science News Letter, April 28, 1945

❁ *GASPROOF PACKAGES for food, to protect against poisonous war gases, is made of nylon heat-sealed about the package of food and coated with a polyvinyl alcohol composition. The nylon resists puncturing and protects against air; the polyvinyl against the poison gases.*

Science News Letter, April 28, 1945

❁ *MESSAGE CONVEYOR, by use of which messages may be dropped from airplanes day or night, consists of a tube to hold the message, a parachute which normally is folded around the tube but opens in descent, and a flashlight with battery inserted in one end of the tube for night dropping.*

Science News Letter, April 28, 1945

❁ *CELLULOSE BANDS that change color when heated are put around the necks of blood transfusion bottles. When the bottles are sterilized, the bands turn from green to orange, thus guarding against using unsterile bottles and the consequent wastage of blood.*

Science News Letter, April 28, 1945

❁ *INSTRUMENT bases and parts are now made of a new plastic developed for the Navy, with good electrical properties and resistance to fire and shock. Instrument parts, shown in the picture, do not give off toxic fumes under high heat. The plastic contains asbestos as an inorganic filler.*

Science News Letter, April 28, 1945

❁ *CRUTCHES on ice will not slip if equipped with a spike and a spike-holding device that may be attached to ordinary crutches. The spike projects when pushed out by a rod extending to the gripping handle of the crutch, and is withdrawn by the same rod. The top of the rod locks in an eye.*

Science News Letter, April 28, 1945

❁ *COMBINATION trunk and cot, recently patented, has a four-section, foldable, canvas-covered, light-metal frame that fits into the trunk's top. When opened, the body of the trunk supports the center of the cot, the trunk's lid supports the head end, and hinged legs support the rest.*

Science News Letter, April 28, 1945

❁ *SANDING DEVICE for automobiles, recently patented, uses the heat of the exhaust gases in a combined muffler and sand reservoir to keep the sand warm, dry and in a flowable condition. The sand reservoir is completely surrounded with an outer chamber through which the gases flow.*

Science News Letter, April 28, 1945

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 256.

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